

ABSTRACT

The present invention relates to a composition and method comprising *Mycobacterium phlei* (*M. phlei*)-DNA (M-DNA), M-DNA preserved and complexed on *M. phlei* cell wall (MCC), a chemotherapeutic agent and a pharmaceutically acceptable carrier, wherein the M-DNA and the MCC induce cell cycle arrest in proliferating cancer cells, inhibit proliferation of cancer cells, induce apoptosis in cancer cells and potentiate the antineoplastic effect of the chemotherapeutic agent on cancer cells.